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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,322	08/15/2001	Gregory F. Welch		3587

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Patent Department  
Mitsubishi Electric Research Laboratories, Inc.  
201 Broadway  
Cambridge, MA 02139

EXAMINER

WALLACE, SCOTT A

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/930,322

Applicant(s)

WELCH ET AL.

Examiner

Scott Wallace

Art Unit

2671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13 and 15-19 is/are rejected.
- 7) ☒ Claim(s) 12, 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Claim Rejections - 35 USC § 112***

1. Claim 13 recites the limitation "Plurality of images". There is insufficient antecedent basis for this limitation in the claim. Claim 13 is dependent from claim 1 and claim 1 only discloses one image.

Date of Reference: The date of reference, Raskar et al came from a search that brought up the enclosed handouts. Under recent work shows the date of Dec 1999 next to Shader Lamps. This is what the examiner used as the reference and date.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-7, 9, 11, 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Raskar et al., "Shader Lamps: Animating Real Objects with Image-Based Illumination".
3. As per claim 1, Raskar et al discloses a method for animating a 3D physical object (pg 1, abstract), comprising: acquiring a 3D graphics model of the 3D physical object (pg 4, Authoring and Alignment); editing the 3D graphics model with graphics authoring tools to reflect a desired appearance of the 3D physical object (pg 4, Authoring and Alignment); rendering the virtual 3D graphics model as an image considering a user location with respect to the 3D physical object and a location of a virtual light (pg 2, The Rendering Process); correcting intensity values of the image according to an orientation of a surface of the object and a radiance at the surface to generate a corrected image (pg 4, Intensity Correction); and illuminating the 3D physical object with the corrected image to give the 3D physical

object the desired appearance under the virtual light when viewed from the user location (pg 1, Abstract, and pg 4, Intensity Correction).

4. As per claim 2, Raskar et al discloses scanning the 3D physical object with a 3D touch probe sensor to acquire the 3D graphics model (pg 6, implementation).

5. As per claim 3, Raskar et al discloses storing the 3D graphics model in a computer memory as a triangle mesh model entirely specified by connected vertices and orientations of the vertices (pg 6, implementation, the triangles of the model are well known to be part of a triangle mesh).

6. As per claim 4, Raskar et al discloses registering a projector with the 3D physical object, the projector configured to illuminate the 3D physical object with the corrected image (pg 4, Methods).

7. As per claim 5, Raskar et al discloses editing view-independent texture and view-dependent material characteristics of the 3D graphics model to reflect the desired appearance (pg 3, column 2, 2<sup>nd</sup> paragraph).

8. As per claim 6, Raskar et al discloses wherein the editing is interactive by applying a hand-held virtual paint brush tool directly to the 3D physical object (pg 4, Authoring and Alignment).

9. As per claim 7, Rasker et al discloses tracking locations of a moving user (pg 6, Tracked Viewer).

10. As per claim 9, Raskar et al discloses specifying separate transformation matrices for the projector and shading parameters that are dependent on the user location (pg 3, 1<sup>st</sup> column, last paragraph; 2<sup>nd</sup> column, 1<sup>st</sup> paragraph).

11. As per claim 11, Raskar discloses wherein the 3D physical object includes an arbitrarily shaped surface oriented at various angles (pg 2, column 1, 2<sup>nd</sup> paragraph, and fig 1).

12. As per claim 16, Raskar et al discloses wherein the projector is a steerable laser (pg 6, column 2, 1<sup>st</sup> paragraph).

13. As per claim 17, since some the images projected are digital images from a computer (pg 7, Conclusion), you would need a digital projector to project them.

14. As per claim 18, Raskar et al discloses a method for animating an 3D physical object (pg 1, abstract), comprising: acquiring a 3D graphics model of a 3D physical object (pg 4, authoring and alignment); approximately positioning a projector (pg 7, 1<sup>st</sup> paragraph); determining a pose of the

projector with respect to the 3D physical object (pg 7, 1<sup>st</sup> paragraph); defining a user location (pg 2, Rendering Process); editing the 3D graphics model to reflect a desired appearance of the 3D physical object (pg 4, Authoring and Alignment); modifying the edited 3D graphics based on the user location (pg 2, the Rendering Process); rendering the modified 3D graphics model as an image based on the pose and user location (pg 2, the Rendering Process); correcting image intensities for surface orientation of the 3D physical object to generated a corrected image (pg 4, Intensity Correction); and projecting the correcting image on the 3D physical object (pg 1, abstract, and pg 2, Intensity Correction).

15. As per claim 19, Raskar et al discloses concurrently projecting a plurality of corrected images on the 3D physical object while blending intensities of the plurality of corrected images for overlap and occlusion (4.3 Occlusions and Overlaps).

***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Raskar in view of Hossack et al., U.S. Patent No. 6,511,426.

18. As per claim 10, Raskar does not disclose wherein the intensities are corrected using alpha-blending of a rendering engine. This is disclosed in Hossack et al in column 19, lines 45-67. It would have

been obvious to one of ordinary skill in the art at the time the invention was made to use alpha-blending to correct intensity values because this allows viewing the object from different angles (column 19 lines 45-67).

19. Claims 8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raskar et al.

20. As per claim 8, Raskar et al does not disclose wherein the moving user is tracked with a stereo-sensor. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a stereo sensor because this would give more accurate positions of the user.

21. As per claim 15, Raskar et al does not disclose wherein the desired appearance simulates a rotation of the 3D physical object. It would have been obvious to one of ordinary skill in the art at the time the invention was made to simulate rotation because rotation shows movement and movement is used to show animation.

***Allowable Subject Matter***

22. Claims 12, 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

23. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

**(703) 872-9314 (for Technology Center 2600 only)**

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Wallace whose telephone number is 703-605-5163. The examiner can normally be reached on Monday thru Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached on 703-305-9798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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